ZOOLOGY.—*Some Actinaria from Bering Sea and arctic waters.*[1] OSKAR CARLGREN, Zoological Institute, Lund, Sweden. (Communicated by MARY J. RATHBUN.)

At the end of 1933 I received from the United States National Museum for examination a small collection of Actinaria taken by Capt. R. A. Bartlett in the course of his expeditions into arctic waters during the past decade. As our knowledge of the Actinarian fauna in the Bering Sea and in the waters continuous with it is very imperfect and every contribution to it interesting, I have taken the liberty of adding to the list of the National Museum collection some specimens from the Swedish expeditions to Kamchatka and the Aleutian Islands (designated in brackets with the letters R.M.). The descriptions of several species, previously imperfectly examined, are here somewhat extended. One species, *Epiactis ritteri* Torrey I have referred to a new genus, *Cnidopus*.

Family PTYCHODACTIIDAE

1. PTYCHODACTIS PATULA App. Mouth Kotsebue Sound, Alaska, Bartlett, 1924, 1 specimen.

The discovery of this species north of Bering Strait is very interesting as it has been taken previously only in Trondheim Fjord, north of Iceland and more recently in Malangen, Norway, at a depth of 350 m. In 1921 (Actiniaria. The Ingolf Exped., 5: 12.) I stated that the throat is not so much reduced as Appellöf described it. In fact the throat in the present specimen is 1–1.5 cm. long; the column, which is rather strongly contracted, 3 cm.

Family HALCAMPIDAE

2. HALCAMPA ARCTICA Carlgr. E. of Alger Island, Alberdare Channel, Franz Joseph Land, Baldwin-Ziegler Expedition, 1901, numerous specimens.

Family CONDYLANTHIDAE

3. CHARISEA SAXICOLA Torrey. Unalaska, Aleutian Islands in pools during the ebb, 3 specimens, Hultén, 1932 (R.M.).

This species appears to be a Condylanthid, though it is not identical with *Charisea*, as Stephenson (Quart. Journ. Micros. Soc. 66: 262.) suggests. The small specimens examined, the largest being only 0.7 cm. long, are little suited to answering this question because the proximal part of the body is introverted, but there seem to be rather distinct basilar muscles. Also the fact that there are a few more mesenteries than tentacles in the greater part of the body would seem to place the species in the family Condylanthi-

[1] Published by permission of the Secretary of the Smithsonian Institution. Received March 19, 1934.

dae. The sectioned specimen has 27 mesenteries, 6+6 pairs and 3 unpaired of the third order, one on one side of the directive plane, two on the other, but only 22 tentacles. Only the mesenteries of the first order are macrocnemes. The gonads, here ovaries, are only little developed. The nematocysts of the column are partly 15–24×4.5μ (penicilli often curved), partly 14–17 ×about 2.5μ, partly 12–13×1μ; those of the tentacles partly 17–21×3.5–4.5μ (often curved), partly 15–19×2–2.5μ (very numerous).

Family ACTINIIDAE

4. Tealia (Urticina) felina L. var. crassicornis. Cape Lisburne, Alaska, beach, H. D. Woolfe, 1835, 1 specimen; mouth Kotsebue Sound, Alaska, Bartlett, 1924, 1 specimen; 62° 15′ 20″ N., 167° 48′ W., Stoney, 1884, 2 specimens; 20 miles off Devil's Mountain, Alaska, Bartlett, 1924, 1 specimen; Wrangell, Alaska, 2 specimens; W. Greenland, 70° 20′ N., 56° W., off Hare Island, 10–15 fms., McClain, 1884, 2 specimens; N.E. Greenland, Clavering Island, 10–35 fms., Bartlett, 1930, 4 specimens; var. *coriacea*, Bering Island, L. Stejneger, 1882–83, 1 large specimen provided with distinct, although somewhat introverted, but rather large verrucae. Therefore, I think that the specimen may be *coriacea* or possibly *tuberculata*, at any rate neither *crassicornis* nor *lofotensis*.

The discovery of a tuberculated form of *Tealia* at Bering Island is very interesting as showing that in Bering Sea, as well as in the Atlantic, smooth forms occur to the north, tuberculated forms to the south.

5. Cribrinopsis similis Carlgr. W. Greenland, 70° 20′ N., 56° W., 90 fms., McClain, 1884, 1 imperfect specimen.
6. Bunodactis spitzbergensis Carlgr. Greenland, Bartlett, 1 specimen.
7. Bunodactis stella Verr. Unalaska, Aleutian Islands, Hultén, 1932, 3 specimens (R.M.).

Verrill states, 1922 (Report Canadian Arctic Exped., 1913–18, 8. G, p. 112), that the number of tentacles may amount to 72, sometimes to 120. The present specimens are considerably larger than those previously described by me (*l.c.* 1921, p. 148) and had more tentacles. One specimen which was examined more closely is provided with about 96 tentacles and mesenteries, and its sphincter is distinctly palmate circumscript.

8. Anthopleura xanthogrammica (Brandt). Saginaw Bay, Alaska, beach, W. H. Jones, 3 specimens; Wrangell, Alaska, 1915, 2 specimens; Bering Island, L. Stejneger, 1882–83, 1 specimen; Nikolski, Bering Island, L. Stejneger, 1897, 3 specimens; Petropaulovsk, Kamchatka, stony beach, low water, Swedish exped., 1921, 1 specimen (R.M.).

The species is described from Port Townsend by McMurrich (Ann. N. Y. Acad. **14**: 36. 1901.), who, moreover, mentions that it occurs also at San Francisco. It is possible that some of McMurrich's specimens belong to

xanthogrammica, but some others may be another species. According to McMurrich, Dr. Calkins states "that evidences of multiplication by fission were not infrequent among the Port Townsend specimens." I have not found any indication of such a reproduction. The 5 specimens, taken from three localities and examined by me are provided with 96 mesenteries and about an equal number of tentacles. Also the sphincter seems to be different. In McMurrich's specimen they are palmate circumscript; in our specimens they are pinnate and resemble the sphincter of *Epiactis ritteri*, although the

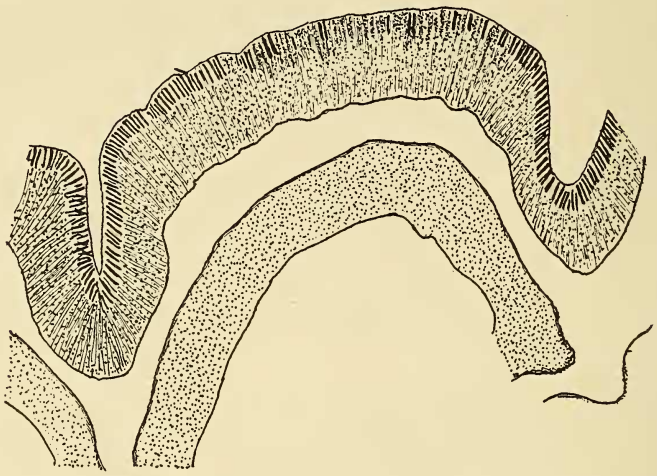

Fig. 1.—*Cnidopus ritteri*. Almost transverse section of a protuberance showing the distribution of the nematocysts (the black rods). Between the nematocysts in the middle of the protuberance are many gland cells.

main lamella here is thinner. Komai and Ikari (Records Oceanographic Works Japan 1: 120. 1929.) mention *xanthogrammica* from Tanabe Bay, not far from the southernmost point of the main island of Japan, but this may be another species, possibly *Anthopleura japonica* Verr. In our specimens, preserved in alcohol, the tentacles, including their apices, the oral disc, and the upper part of the column are greenish, the marginal sphaerules and the actinopharynx colorless, the pigment being situated in the endoderm. I have more closely examined a specimen the mesenteries of which are arranged $6+6+12+24=48$ pairs, 2 of which are directives. All mesenteries except the directives are fertile; all or almost all perfect. The pennons are considerably stronger than those figured by McMurrich and remind one of those of *Tealia felina*. The parietobasilar and the basilar muscles are strong. The marginal sphaerules are large in a specimen from Bering Island, corresponding with the endocoels as well as with the exocoels. Meanwhile, the number and size of the marginal sphaerules vary, as is common in species having such organs. In another specimen they are smaller and more sparse, and in the two specimens from Kamchatka I could not find any. It is possible, however,

that they are present but very small and few in number. The nematocysts of the marginal spherules in three specimens examined are (50) 55–67, 55–68, 55–69×3.5–4.5μ, those of the lower part of the column (one specimen examined) 18–22×2–2.5μ, those of the uppermost part 14–17×1.5–2μ, those of the tentacles 17–22×(2) 2.5μ (very numerous), those of the actinopharynx 23–26×2.5μ.

Cnidopus, new genus

Actiniid with broad pedal disc. Column smooth, in the lower part, from the limbus upward, provided with transverse and longitudinal rows of low protuberances square at the base and very close together. The sides of these protuberances and the furrows between them form strong nematocyst batteries. Sphincter circumscript. Tentacles rather short, comparatively numerous, as a rule arranged hexamerously. Longitudinal muscles of the tentacles and radial muscles of oral disc ectodermal. Mostly 2 siphonoglyphes. Mesenteries for the most part perfect, and more numerous than the tentacles. Pennons of the mesenteries not strong, parietobasilar and basilar muscles strong. Mesenteries of the first and second cycles probably sterile.

9. Cnidopus ritteri (Torrey). St. Georges Island, Alaska, G. D. Hanna, 1914, 7 specimens. ? Nikolski, Bering Island, Stejneger, 1897, 1 specimen.

This species, described and referred by Torrey (Proc. Washington Acad. Sci. 4: 393. 1902.) to the genus *Epiactis* is here referred to a new genus for which I propose the name *Cnidopus* owing to the very numerous nematocysts present at the sides of the protuberances and between them in the lowest part of the column. Torrey describes the exterior of the column in the following manner: "The body-wall is smooth, without true verrucae, though near the foot there may be ten or twelve rows of protuberances which slightly resemble them. They are caused by transverse and longitudinal wrinkles and are of the same histological character as the rest of the wall. They vary greatly in size even in the same individual." (See fig. 6, pl. 25 in Torrey's paper). Our specimens show the same exterior, so that it is clear that we have to do with *E. ritteri*. Like Torrey's, our specimens are rather strongly contracted, wherefore it is probable that the protuberances, in our specimens arranged in 8–14 longitudinal rows, in the extended state have a more vesicle-like appearance. The histological structure of the protuberances is, however, other than Torrey stated. The sides of the protuberances and the furrows are provided with very numerous nematocysts standing, as in the marginal sphaerules, very close together. Only in the middle of the protuberances the nematocysts, especially the larger, are sparse or almost lacking on some protuberances more than on others. (Fig. 1). There are two sizes of these nematocysts—unfortunately they are opaque, so that I cannot decide their structure—the larger of which reach a size not observed by me in the vesicles of any one Actiniid (including Phyllactids) except in the marginal sphaerules. The size of the larger nematocysts varies in 4 specimens

between 31–41×4.5–5μ, (35–41×4.5–5μ, 32–41×4.5μ, 31–41×4.5–5μ, and in the smaller specimen 31–36×4.5μ); the smaller between 17–26×2–2.5μ (22–26×2–2.5μ, 21–26×2–2.5μ, 19–24×2–2.5μ, 17–22×almost 2.5μ in the smallest specimen). In the other parts of the column only the small nematocysts (17–24×about 2.5μ) are present, although I observed in some macerated preparations a few larger nematocysts, possibly stuck to the ectoderm. The sphincter is in all specimens pinnate circumscript, as is that figured by Torrey. The longitudinal muscles of the tentacles and radial muscles of the oral disc are well developed and palisade-like arranged. Three specimens examined have 2 siphonoglyphes and 2 pairs of directives. One specimen more closely examined has 192 mesenteries, but only 172 tentacles, thus the number of tentacles is fewer than that of the mesenteries. All mesenteries are perfect, except those of the last cycle and possibly some of the fourth. Torrey stated that the mesenteries of the last cycle were sterile, all others fertile. Although the strong contraction of the large specimen examined makes it difficult to determine exactly the distribution of the gonads, I am able to state that the mesenteries of the fifth (the last cycle), fourth, and partly those of the third cycles have ovaries; on the other hand, I have not observed any on the mesenteries of the first and second cycles. The pennons of the mesenteries are rather thin, the parietobasilar muscles broad and reaching almost the margin, the basilar muscles well developed, oral and marginal stomata present. The nematocysts of the tentacles are in 5 specimens 29–32×2.5μ; 26–30×2 (2.5) μ, 24–29×2μ, 26–31×almost 2.5μ, 19–29×almost 2.5μ (in the smallest specimen); those of the actinopharynx 27–32 ×2.5μ, 26–30×2.5μ, 26–29×2.5μ, 29–32×2.5μ (in one specimen I find also some large nematocysts 29–36×4.5–5μ, possibly stuck to the ectoderm). The penicilli of the filaments are in one specimen 26–31×4.5–5μ, the spirocysts of the tentacles 22–43×2.5—almost 3.5μ, 22–41×3.5μ (2 specimens examined).

Family ACTINOSTOLIDAE

10. Stomphia coccinea (O.F.M.). Coal station near Cape Lisburne, Alaska, beach after 4 days of N.W. gale, H. D. Woolfe, 1885, 3 specimens; Saglek Bay, Labrador, Bartlett, 1925, 1 specimen.
11. Actinostola spitzbergensis Carlgr. Mouth Kotsebue Sound, Alaska, Bartlett, 1924, 1 specimen; 20 miles off Devil's Mountain, Alaska, 16–18 fms., mud bottom, Bartlett, 1924, 2 specimens; Clavering Island, N.E. Greenland, 10–35 fms., Bartlett, 1930, 1 specimen.

Family HORMATHIIDAE

12. Hormathia nodosa (Fabr.). Entrance to Fury & Hecla Straits, Baffin Land, Norcross & Bartlett, 1933, 1 specimen; Saglek Bay, Labrador, Bartlett, 1925, 1 specimen; 70° 20′ N. off Hare Island, W. Greenland, 2 specimens; Clavering Island, N.E. Greenland, 10–35 fms., Bartlett, 1930, 3 small specimens; Greenland, Bartlett, 1 specimen; 80° 22′, N.W.

coast of McClintock Island, Franz Joseph Land, Baldwin-Ziegler Exped., 1902, 1 specimen.

13. METRIDIUM SENILE (L.) var. FIMBRIATUM. St. Michaels, Norton Sound, Alaska, E. W. Nelson, 1879–80, low water, 3 specimens; Unalaska, Aleutian Islands, Hultén, 1932, 5 specimens (R.M.); Petropaulovsk, Kamchatka, Swedish Kamchatka Exped., 1921, 4 specimens (R.M.); Awatcha Bay, Swedish Kamchatka Exped., 1921, some small specimens (R.M.); Achomten Bay, Swedish Kamchatka Exped., 1920, 1 specimen (R.M.).

Among the specimens from Unalaska there is a small one (0.5×0.6 cm.), the nematocysts of the acontia of which are: Penicilli 47–58×about 5μ, spirulae 47–57×3–3.5μ. In a small specimen of the variety *dianthus* of about the same size as the variety *marginatum* the penicilli of the acontia are 46–50 ×almost 5.5μ, the spirulae 38–50×3–3.5μ. Thus it seems that also young specimens of *marginatum* have larger nematocysts than *dianthus* in the acontia (compare Carlgren, *The Godthaab Exped.*, 1928. Medd. om Grønland 79: 23–24. 1933.).

ZOOLOGY.—Neodiplostomum pricei *n.sp., a new trematode from a gull,* Larus novaehollandiae.[1] WENDELL H. KRULL, Bureau of Animal Industry. (Communicated by MAURICE C. HALL.)

The fluke described in this paper was obtained from an Australian silver gull, *Larus novaehollandiae* Stephens, which had been experimentally infected by feeding it fish, *Fundulus diaphanus diaphanus* and *F. heteroclitus macrolepidotus*, containing metacercariae of the neascus type. The species appears to be new and for it the name *Neodiplostomum pricei* is proposed.

Neodiplostomum pricei n. sp.

(Figs. 1–2)

Description.—Neodiplostomum: Body small, distinctly separated by constriction into a forebody and hindbody. Forebody 1.2 mm. to 1.6 mm. (average 1.4 mm.) long by 600μ to 665μ (average 632μ) wide, spoon-shaped, relatively thin and leaf-like, without glands and lateral sucking cups; hindbody 550μ to 880μ (average 748μ) long by 410μ to 520μ (average 472μ) wide, roughly cone to acorn-shaped when bursa copulatrix is withdrawn. Cuticula provided with fine spines extending from anterior end to level of holdfast organ. Oral sucker 37μ to 60μ (average 47μ) long by 30μ to 44μ (average 38μ) wide and subterminal. Mouth opening into a short prepharynx about one-third as long as pharynx. Pharynx 33μ to 53μ (average 43μ) long by 26μ to 41μ (average 33μ) wide. Esophagus twice as long as pharynx, bifurcating to form narrow, thin-walled ceca extending to near level of posterior end of posterior testis; ceca ventral in position in hindbody. Acetabulum 55μ to 92μ (average 76μ) long by 73μ to 112μ (average 91μ) wide, midway between

[1] Received April 17, 1934.